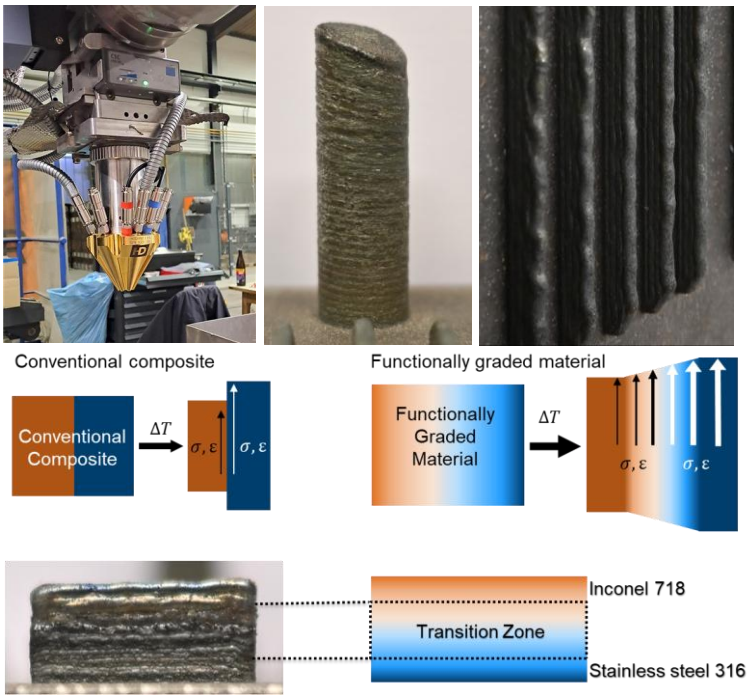
Understanding Process-Structure-Property Relationships in L-DED of 316L and IN718: A Critical Review of Key Parameters

Content

Laser Directed Energy Deposition (L-DED) enables performance-driven manufacturing by tailoring material microstructure in-situ. Achieving this requires a fundamental understanding of the Process-Structure-Property (PSP) relationships for alloys like 316L and IN718. This work critically reviews the current state of knowledge on the PSP linkage to identify research gaps and future directions.



Tasks

- Deconstruct the influence of process parameters on microstructural evolution (e.g., grain texture, phase formation).
- Critically assess the established links between microstructure and final mechanical properties (e.g., anisotropy, strength).
- Identify key scientific challenges to guide future research and predictive modeling.

Prerequisites

- Interested in additive manufacturing and metallurgical knowledge.

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